Are Bacteria Transport Properties Correlated to Hydraulic Conductivity and Geochemical Heterogeneity of the Porous Medium "Synthetic Porous" ?

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Water contamination due to cracks in wells, allow both bacteria and viruses to get in. After Hurricane Irma, this became a dilemma for many. The purpose of this project is to (using natural materials) find a way to block out both bacteria's and viruses from getting into aquifers, and contaminating the pure water found in these sources. This researcher hypothesized that if bacteria transport properties were tested using a stochastic model, then, the peat soil would be the most successful, due to its absorbency. The procedure starts with building a stochastic model (using pvc pipes and plastic containers). Next, 100ml of a bacteria broth was poured into each of the 5 containers containing; peat soil, crushed lime rock, red lava rock, pea pebbles, and quartz sand. Then, for 2 days, twice a day, pour 250 ml of H2O (to synthesize rain water) into the models. Remove materials at 5cm and 20cm to collect bacterial results, which were swabbed, plated, and incubated for 12 hours. producing 10 trials. In test 2, materials used were: fine grain, medium grain, coarse grain sands, peat soil, and crushed lime rock; water was drawn all the way through and out of the models and tested for bacteria with an incubation period of 24hrs. Results in test 1 and 2 proved that crushed limestone had a 75% decrease in bacteria, fine sand an 80% decrease. The peat soil had an increased amount of bacteria. The sands were used in test 2 to attempt an inexpensive way of cleaning the water supply.

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